Listing of Claims:

The following listing of claims will replace all prior versions and listings of claims in the application.

Claims 1-13 (Canceled)

Claim 14. (Previously presented) A level measuring device, for producing a level value representative of a level in a vessel, said level measuring device operating with microwave bursts, comprising:

a transceiver unit for generating a level-dependent intermediate-frequency signal by means of a transmit signal and a receive signal, said transmit signal being generated from a burst sequence;

a transducer element which in operation couples transmitted microwaves into the vessel under control of the transmit signal and which converts echo waves reflected from the contents of the vessel into the receive signal; and

a control unit with a volatile data memory for storing, at least temporarily, a finite sampling sequence currently representing the intermediate-frequency signal, wherein:

a repetition rate of said transmit signal is set at a range above 1 MHz and a center frequency of said transmit signal is set at a range above 0.5 GHz, and

a center frequency of said intermediate-frequency signal lies above 50 kHz.

Claim 15. (Previously presented) The level measuring device as set forth in claim 14, which determines the level value by means of amplitude information derived from the sampling sequence.

Claim 16. (Previously presented) The level measuring device as set forth in claim 14, which determines the level value by means of phase information derived from the sampling sequence.

Claim 17. (Previously presented) The level measuring device as set forth in claim 14, wherein the volatile data memory holds, at least temporarily, a first signal sequence, which represents a numerically performed multiplication of the sampling sequence by a digital sine-wave signal sequence.

Claim 18. (Previously presented) The level measuring device as set forth in claim 17, wherein the volatile data memory holds, at least temporarily, a first quadrature-signal sequence, which represents a numerically performed downconversion of at least a portion of the first signal sequence.

Claim 19. (Previously presented) The level measuring device as set forth in claim 18, wherein the volatile data memory holds, at least temporarily, a first average - value sequence, which serves in particular to generate the first quadrature - signal sequence.

Claim 20. (Previously presented) The level measuring device as set forth in claim 14, wherein the volatile data memory holds, at least temporarily, a digital phase sequence which corresponds to a temporal phase variation of at least a portion of the intermediate - frequency signal.

Claim 21. (Previously presented) The level measuring device as set forth in claim 14, wherein the volatile data memory holds, at least temporarily, a digital envelope which represents a temporal amplitude variation of the intermediate - frequency signal.

Claim 22. (Previously presented) A level measuring device for producing a level value representative of a level in a vessel, said level measuring device operating with microwave bursts, comprising:

a transceiver unit for generating a level-dependent intermediate-frequency signal by means of a transmit signal and a receive signal;

a transducer element which in operation couples waves, into the vessel under control of the transmit signal and which converts echo waves reflected from the contents of the vessel into the receive signal; and

a control unit with a volatile data memory, said volatile data memory storing, at least temporarily, a finite sampling sequence currently representing the intermediate-frequency signal, a first signal sequence, which represents a numerically performed multiplication of the sampling sequence by a digital sine-wave signal sequence, and a second signal sequence, which represents a numerically performed multiplication of the sampling sequence by a digital cosine-wave signal sequence.

Claim 23. (Previously presented) The level measuring device as set forth in claim 22, which comprises a logarithmic amplifier for the intermediate-frequency signal.

Claim 24. (Previously presented) The level measuring device as set forth in claim 17, wherein the volatile data memory holds, at least temporarily, a second signal sequence, which represents a numerically performed multiplication of the sampling sequence by a digital cosine-wave signal sequence.

Claim 25. (Previously presented) The level measuring device as set forth in claim 18, wherein the volatile data memory holds, at least temporarily, a second signal sequence, which represents a numerically performed multiplication of the sampling sequence by a digital cosine-wave signal sequence, and wherein the volatile data memory holds, at least temporarily, holds a second quadrature - signal sequence, which represents a numerically performed downconversion of at least a portion of the second signal sequence.

Claim 26. (Previously presented) The level measuring device as set forth in claim 24, wherein the volatile data memory holds, at least temporarily, a quadrature - signal sequence, which represents a numerically performed downconversion of at least a portion of the second signal sequence.

Claim 27. (Previously presented) The level measuring device as set forth in claim 19, wherein the volatile data memory holds, at least temporarily, a second average-value sequence, which serves in particular to generate the second quadrature-signal sequence and represents a variation of a time average of at least a portion of the second signal sequence.

Claim 28. (Previously presented) The level measuring device as claimed in claim 14, wherein the transducer element couples pulsed waves into the vessel.

Claim 29. (Previously presented) the level measuring device as claimed in claim 14, wherein the transmit signal is a burst sequence having a center frequency lying in a range between 0.5 GHz and 30 GHz.

Claim 30. (Previously presented) The level measuring device as claimed in claim 14, wherein the transmit signal is a burst sequence having a center frequency lying above 30 GHz.

Claim 31. (Previously presented) The level measuring device as claimed in claim 14, wherein the transmit signal is a burst sequence having a repetition rate being set at a range between 1 MHz and 10 MHz.

Claim 32. (Previously presented) The level measuring device as claimed in claim 14, wherein the transmit signal is a burst sequence having a repetition rate lying above 10 MHz.

Claim 33. (Previously presented) The level measuring device as set forth in claim 14, which comprises a logarithmic amplifier for the intermediate-frequency signal.

Claim 34. (Previously presented) A level measuring device for producing a level value representative of a level in a vessel, said level measuring device operating with microwaves, comprising:

a transceiver unit for generating a level-dependent intermediate-frequency signal by means of a transmit signal and a receive signal;

a transducer element coupling pulsed microwaves into the vessel under control of the transmit signal, and converting echo waves reflected from the contents of the vessel into the receive signal; and

a control unit with a volatile data memory for storing, at least temporarily, a finite sampling sequence currently representing the intermediate-frequency signal, wherein

a repetition rate of said transmit signal is set at a range above 1 MHz and a center frequency of said transmit signal is set at a rage above 0.5 GHz, and

a center frequency of said intermediate-frequency signal lies above 50 kHz.

Claim 35. (Previously presented) The level measuring device as set forth in claim 34, which determines the level value by means of amplitude information derived from the sampling sequence.

Claim 36. (Previously presented) The level measuring device as set forth in claim 34, which determines the level value by means of phase information derived from the sampling sequence.

Claim 37. (Previously presented) The level measuring device as set forth in claim 34, wherein the volatile data memory holds, at least temporarily, a first signal sequence representing a numerically performed multiplication of the sampling sequence by a digital sine-wave signal sequence.

Claim 38. (Previously presented) The level measuring device as set forth in claim 37, wherein the volatile data memory holds at least temporarily, a second signal sequence representing a numerically performed multiplication of the sampling sequence by a digital cosine-wave signal sequence.

Claim 39. (Previously presented) The level measuring device as set forth in claim 37, wherein the volatile data memory holds, at least temporarily, a first quadrature-signal sequence, which represents a numerically performed downconversion of at least a portion of the first signal sequence.

Claim 40. (Previously presented) The level measuring device as set forth in claim 38, wherein the volatile data memory holds, at least temporarily a first quadrature-signal sequence, which represents a numerically performed downconversion of at least a portion of the first signal sequence, and wherein the volatile data memory holds, at least temporarily, a second quadrature-signal sequence, which represents a numerically performed downconversion of at least a portion of the second signal sequence.

Claim 41. (Previously presented) The level measuring device as set forth in claim 39, wherein the volatile data memory holds, at least temporarily, a first quadrature-signal sequence, which represents a real part of said intermediate-frequency signal, and a second quadrature-signal sequence, which represents an imaginary part of said intermediate-frequency signal.

Claim 42. (Previously presented) The level measuring device as set forth in claim 40, wherein the volatile data memory holds, at least temporarily, a data record which corresponds to a phase of a data record of the sampling sequence and represents a numerical division of a data record selected from the first quadrature - signal sequence by data record selected from the second quadrature - signal sequence, said data record selected from the first quadrature-signal sequence having an index of

essentially equal with an index of said data record selected from the second quadrature-signal sequences.

Claim 43. (Previously presented) The level measuring device as set forth in claim 38 wherein the volatile data memory holds, at least temporarily, a first average value sequence, which represents a variation of a time average of at least a portion of the first signal sequence and a second average-value sequence, which represents a variation of a time average of at least a portion of the second signal sequence.

Claim 44. (Previously presented) The level measuring device as set forth in claim 43, wherein the first average-value sequence serves to generate the first quadrature-signal sequence, and wherein the second average - value sequence serves to generate the second quadrature - signal sequence.

Claim 45. (Previously presented) The level measuring device as set forth in claim 34, wherein the volatile data memory holds, at least temporarily, a first digital phase sequence which corresponds to a temporal phase variation of at least a portion of the intermediate-frequency signal.

Claim 46. (Previously presented) The level measuring device as set forth in claim 45, wherein the volatile data memory holds, at least temporarily, a second digital phase sequence which corresponds to a temporal phase variation of at least a portion of the intermediate frequency signal.

Claim 47. (Previously presented) The level measuring device as set forth in claim 34, wherein the volatile data memory holds, at least temporarily, a digital envelope representing a temporal amplitude variation of the intermediate-frequency signal.

Claim 48. (Previously presented) The level measuring device as claimed in claim 34 wherein the transducer element couples pulsed waves into the vessel.

Claim 49. (Previously presented) The level measuring device as claimed in claim, 34 wherein the transmit signal is a burst sequence having a center frequency and a repetition rate.

Claim 50. (Previously presented) The level measuring device as set forth in claim 34, which comprises a logarithmic amplifier for the intermediate-frequency signal.

Claim 51. (Previously presented) The level measuring device as claimed in claim 34, wherein the transmit signal is a burst sequence having a center frequency lying in a range between 0.5 GHz and 30 GHz.

Claim 52. (Previously presented) The level measuring device as claimed in claim 34 wherein the transmit signal is a burst sequence having a center frequency lying above 30 GHz.

Claim 53. (Previously presented) The level measuring device as claimed in claim 34 , wherein the transmit signal is a burst sequence having a repetition rate being set at a range between 1 MHz and 10 MHz.

Claim 54. (Previously presented) The level measuring device as set forth in claim 34, wherein the transmit signal is a burst sequence having a repetition rate lying above 10 MHz.

Claim 55. (Previously presented) The level measuring device as set forth in claim 34, wherein the transceiver unit comprises a mixer delivering the intermediate - frequency signal.

Claim 56. (Currently Amended) A level measuring device operating with microwaves for producing a level value representative of a level in a vessel, said level measuring device comprising:

a transceiver unit for generating a level-dependent intermediate-frequency signal by means of a transmit signal and a receive signal, said transmit signal is a sequence of bursts having a predetermined center frequency and a predetermined repetition rate, said intermediate-frequency signal having a center frequency corresponding with said center frequency of said transit signal;

a transducer element coupling pulsed microwaves into the vessel under control of the transmit signal, and converting echo waves reflected from the contents of the vessel into the receive signal; and

a control unit with an analog-to-digital converter and with a digital level computer, said analog-to-digital converter being coupled to an output of the transceiver unit providing said intermediate-frequency signal, and said analog-to-digital converter providing said digital level computer with a digital intermediate-frequency signal, wherein:

~~wherein~~ the digital level computer derives said level value by using said digital intermediate frequency signal;

a repetition rate of said transmit signal is set at a range about 1 Mhz;

a center frequency of said transmit signal is set at a range above 0.5 GHz; and

a center frequency of said intermeidate-frequency signal lies above 50 kHz.

Claim 57. (Previously presented) The level measuring device as claimed in claim 56, wherein the control unit comprises a volatile data memory for storage, at least temporarily, a finite sampling sequence currently representing the intermediate - frequency signal.

Claim 58. (Previously presented) The level measuring device as set forth in claim 56, which comprises a logarithmic amplifier for the intermediate-frequency signal generated by the transceiver unit, said logarithmic amplifier being coupled to said analog-to-digital converter.

Claim 59. (Previously presented) The level measuring device as set forth in claim 25, wherein the volatile data memory holds, at least temporarily, a second average-value sequence, which serves in particular to generate the second quadrature-signal sequence and represents a variation of a time average of at least a portion of the second signal sequence.

Claim 60. (Previously presented) The level measuring device as set forth in claim 25, wherein the volatile data memory holds, at least temporarily, a data record which corresponds to a phase of a data record of the sampling sequence and represents a numerical division of a data record of the first quadrature-signal sequence by an essentially equal-locus data record of the second quadrature-signal sequence.

Claim 61. (Previously presented) The level measuring device as set forth in claim 14, further comprising:

a communications unit for sending measuring data to a remote area.

Claim 62. (Previously presented) The level measuring device as set forth in claim 14, wherein:

said transceiver unit includes a mixer circuit which outputs an intermediate - frequency signal for delivery to said control unit.

63. (Previously presented) The level measuring device as set forth in claim 14 wherein the volatile data memory holds, at least temporarily, a first quadrature-signal sequence, which represents a real part of said intermediate-frequency signal, and a

second quadrature-signal sequence, which represents a imaginary part of said intermediate-frequency signal.

64. (Previously presented) The level measuring device as set forth in claim 14 which determines the level value by means of phase information derived from the sampling sequence.

65. (Previously presented) The level measuring device as set forth in claim 14 which determines the level value by means of amplitude information derived from the sampling sequence.

66. (Previously presented) The level measuring device as set forth in claim 14 which comprises a logarithmic amplifier for the intermediate-frequency signal.

67. (Previously presented) The level measuring device as set forth in claim 22 wherein a repetition rate of said transmit signal is set at a range above 1 MHz and a center frequency of said transmit signal is set at a range above 0,5 GHz and wherein a center frequency of said intermediate-frequency signal lies above 50 kHz.

68. (Previously presented) The level measuring device as claimed in claim 67 wherein the repetition rate of said transmit signal is set at a range between 0.5 GHz and 30 GHz.

69. (Previously presented) The level measuring device as claimed in claim 67 wherein the transmit signal is a burst sequence having a center frequency lying above 30 GHz.

70. (Previously presented) The level measuring device as claimed in claim 67 wherein the center frequency of said transmit signal is set at a range between 1 MHz and 10 MHz.

71. (Previously presented) The level measuring device as claimed in claim 67 wherein the center frequency of said transmit signal is set at a range above 10 MHz.

72. (Currently Amended) A level measuring device for producing a level value representative of a level in a vessel said level measuring device operating with microwaves, and said level measuring device comprising:

a transceiver unit for generating a level-dependent intermediate-frequency signal by means of a transmit signal and a receive signal;

a transducer element which in operation couples pulsed waves into the vessel under control of the transmit signal and which converts echo waves reflected from contents of the vessel into the receive signal; and

a control unit with a volatile data memory, said volatile data memory storing, at least temporarily, a finite sampling sequence currently representing the intermediate-frequency signal, a first quadrature-signal sequence, which represents a real part of said intermediate-frequency signal, and a second quadrature-signal sequence, which represents a imaginary part of said intermediate-frequency signal, wherein:

a repetition rate of said transmit signal is set at a range about 1 MHz;

a center frequency of said transmit signal is set at a range above 0.5 GHz; and

a center frequency of said intermeidate-frequency signal lies above 50 kHz.

73. (Previously presented) The level measuring device as set forth in claim 72 wherein a repetition rate of said transmit signal is set at a range above 1 MHz and a center frequency of said transmit signal is set at a range above 0,5 GHz and wherein a center frequency of said intermediate-frequency signal lies above 50 kHz.

74. (Previously presented) The level measuring device as claimed in claim 72 wherein the repetition rate of said transmit signal is set at a range between 0.5 GHz and 30 GHz.

75. (Previously presented) The level measuring device as claimed in claim 72 wherein the transmit signal is a burst sequence having a center frequency lying above 30 GHz.

76. (Previously presented) The level measuring device as claimed in claim 72 wherein the center frequency of said transmit signal is set at a range between 1 MHz and 10 MHz.

77. (Previously presented) The level measuring device as claimed in claim 72 wherein the center frequency of said transmit signal is set at a range above 10 MHz.

78. (Currently Amended) A method for determining a level of contents in a vessel, said method comprising the steps of:

mounting a level measuring device on said vessel, said level measuring device comprising a control unit, which includes a volatile data memory, a transducer element, said transducer element being adapted to couple microwaves into the vessel and said transducer element being adapted to receive microwaves reflected from said contents, a transceiver unit adapted to provide said control unit with a level-dependent intermediate-frequency signal;

generating a transmit signal and transferring said transmit signal to said transducer element;

using said transducer element to couple, under control of said transmit signal, pulsed microwaves into the vessel;

receiving from said vessel echo waves, which correspond with said microwaves coupled into the vessel, and using said transducer element to convert said echo waves into a receive signal;

using said transmit signal and said receive signal to generate said level-dependent intermediate-frequency signal;

digitizing said intermediate-frequency signal for generating a finite sampling sequence currently representing the intermediate-frequency signal, and storing said finite sampling sequence into said volatile data memory;

deriving from said finite sampling sequence a first quadrature-signal sequence and a second quadrature-signal sequence, said first quadrature-signal sequence representing a real part of said intermediate-frequency signal, and said second quadrature-signal sequence representing an imaginary part of said intermediate-frequency signal; and

using said first and second quadrature-signal sequences for generating a level value representative of said level to be determined, wherein:

a repetition rate of said transmit signal is set at a range about 1 MHz;

a center frequency of said transmit signal is set at a range above 0.5 GHz; and

a center frequency of said intermeidate-frequency signal lies above 50 kHz.

79. (Previously presented) The method as claimed in claim 78, wherein a repetition rate of said transmit signal is set at a range above 1 MHz and a center frequency of said transmit signal is set at a range above 0,5 GHz.

80. (Previously presented) The method as claimed in claim 79, wherein a center frequency of said intermediate-frequency signal lies above 50 kHz.

81. (Previously presented) The method as claimed in claim 78, further comprising steps of using said first and second quadrature-signal sequences for generating a digital envelop representing an amplitude variation of said intermediate-frequency signal, and using said digital envelop for generating said level value.

82. (Previously presented) The method as claimed in claim 78, further comprising steps of using said first and second quadrature-signal sequences to generate a phase value representing a phase of said receive signal relative to said transmit signal and, and using said digital envelop for generating said level value.